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Bovine Somatotropin

Background

Since FDA approval in 1994, the use of recombinant bovine Somatotropin (rbST or bST) on U.S. dairy farms has increased, especially on large, high producing operations.[1] Repeated studies have demonstrated that administering bST to lactating dairy cattle significantly increases milk production, with few adverse effects in treated cows and little or no impact on milk quality.[2]

Supplementation with bST results typically in an average increase in milk yield of 10 pounds per cow, per day. This can improve peak milk and maintain higher milk production throughout lactation.

The manufacturer of bST recommends that bST be administered to cows 57 to 70 days postpartum.[3] This voluntary postcalving waiting period allows the cows to adequately increase food intake to meet the natural high energy demands of lactation, before adding more demand with bST. Administration of bST before this period can further exacerbate the negative energy balance experienced in early lactation, which can cause excessive loss of body weight and may lead to decreased conception rates.[4] The reproductive performance of first-calf heifers and cows with a lower body-condition score at calving may be enhanced if there is a longer delay after calving (e.g., 120 days) before bST supplementation.[5] Standard protocol for the administration of bST is once every 14 days until dry-off.[4]

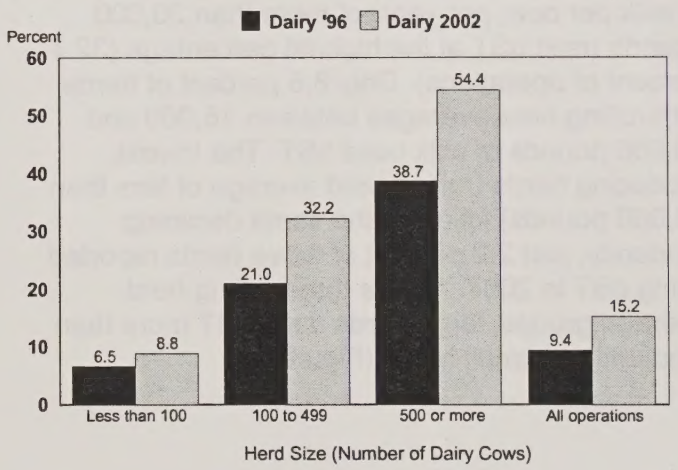
In addition to the animal health issues of decreased reproductive performance and negative energy balance, other concerns dairy producers have about bST use include: the cost and ease of implementing a bST program; the intensive nutritional management and monitoring involved; and public health concerns.[4]

*California, Colorado, Florida, Idaho, Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New Mexico, New York, Ohio, Pennsylvania, Tennessee, Texas, Vermont, Virginia, Washington, Wisconsin

Dairy 2002 Study Results

The National Animal Health Monitoring System (NAHMS) Dairy 2002 study assessed the use of bST in dairy herds in 21 States*. Overall, 15.2 percent of participating dairy herds were using bST in 2002. A total of 22.3 percent of cows received the hormone. Among large herds (500 or more cows), 54.4 percent used bST in one or more cows, while only 32.2 percent of medium herds (100 to 499 head) and 8.8 percent of small herds (less than 100 head) used the hormone (Figure 1). The previous NAHMS dairy study, Dairy '96, found that only 9.4 percent of all operations used bST. Among dairies with 500 or more cows, 38.7 percent used bST in one or more cows at that time. Use in medium and small herds was reported in Dairy '96 as 21.0 percent and 6.5 percent, respectively.[6]

Figure 1. Percent of Operations by bST Use in 1996 and 2002, and by Herd Size.

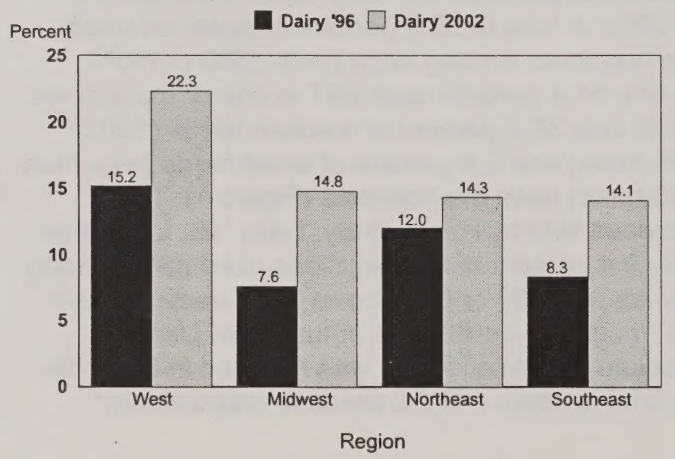


In herds using bST in 2002, approximately 59.1 percent of cows received or were scheduled to receive bST during the current lactation. In 1996, 49.2 percent of cows in herds using bST received the hormone or were scheduled to receive the hormone at the time of the interview.[6] The Dairy 2002 study found that among dairies using bST, the initial treatment was administered, on average, 81

days after calving. The final treatment was given, on average, on postcalving day 270.

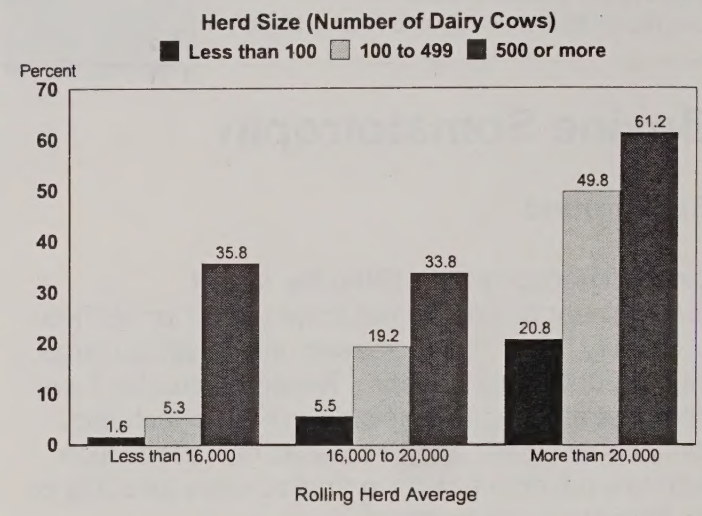
The use of bST in 2002 was fairly uniform across all study regions, with the exception of the West.[7] In the West region, 22.3 percent of dairies used bST; the next highest region (Midwest) was 14.8 percent. In 1996, bST use ranged from 7.6 percent of operations in the Midwest region to 15.2 percent of operations in the West region (Figure 2).

Figure 2. Percent of Operations Using bST, by Region.



Herds with a rolling herd average (average pounds of milk per cow, per year) of more than 20,000 pounds used bST at the highest percentage (32.4 percent of operations). Only 8.6 percent of herds with rolling herd averages between 16,000 and 20,000 pounds of milk used bST. The lowest producing herds (rolling herd average of less than 16,000 pounds) followed the same declining tendency; just 2.2 percent of those herds reported using bST in 2002. Across three rolling herd average groups, large herds used bST more than medium and small herds (Figure 3).

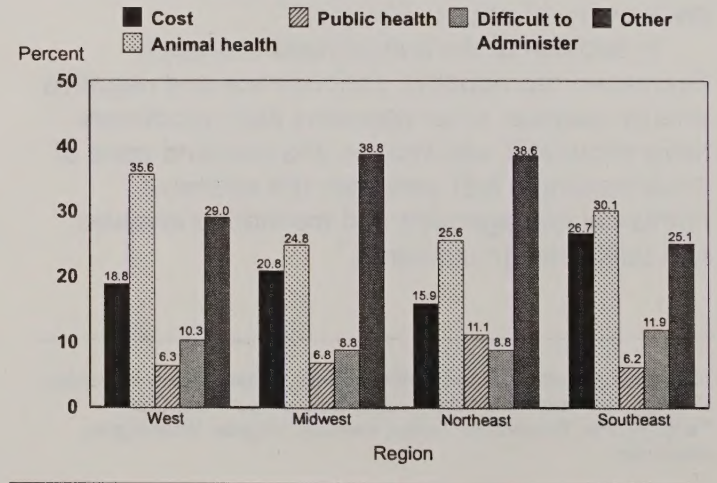
Figure 3. Percent of Operations Using bST, by Rolling Herd Average and by Herd Size.



Dairy 2002 asked producers that were *not* currently using bST to describe their reason for not implementing a bST program. Responses varied between regions. For example, cost and animal health were major concerns specifically identified in all regions, but public health concerns were twice as prominent in the Northeast region as in any other region.

West and Southeast producers listed the health of the animals as the primary reason for not using bST. The Midwest and Northeast dairies reported "other reasons," including personal beliefs, dairy plant or creamery regulations, or organic status, as the principle reasons for not using bST (Figure 4).

Figure 4. Percent of Operations by Reason for Not Using bST and by Region.



Conclusions

Nationally, 15.2 percent of the herds were using bST at the time of the Dairy 2002 study (a 5.8 percent increase from Dairy '96) while 22.3 percent of cows received the hormone. Although the increase in bST use was observed in all herd sizes, large herds used the hormone 6.2 times more often in than small herds. Use of bST was also more common in higher producing herds (greater rolling herd averages) than in lower producing herds. The use of bST was greater in the West region than in the other regions. Cost, animal health, and "other reasons" were the main reasons producers gave for not using bST on their dairies.

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[1] USDA/APHIS/VS Info Sheet. 1996. Management Practices Associated with High-Producing U.S. Dairy Herds.
[2] FDA, Center for Veterinary Medicine, 1999. CVM Update. http://www.fda.gov/cvm/index.updates
[3] http://www.monsantodairy.com
[4] Grant R and Keown J. 1996. Feeding the bovine Somatotropin (bST) treated dairy cow. Coop. Extension, IANR, Univ. Neb.
[5] Silvia WJ, Hemken RW and Halter TB. 2002. Timing of onset of Somatotropin supplementation on reproductive performance in dairy cows. J Dairy Sci. 85:384-389.
[6] USDA/APHIS/VS/NAHMS. 1996. Part I: Reference of 1996 Dairy Management Practices.
[7] Dairy 2002 regions: West: California, Colorado, Idaho, New Mexico, Texas, Washington; Midwest: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin; Northeast: New York, Pennsylvania, Vermont; Southeast: Florida, Kentucky, Tennessee, Virginia.

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